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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,950	08/21/2003	Jasper D. Rine	B96-021-6	2061

23379 7590 09/26/2006

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EXAMINER	
RAMIREZ, DELIA M	

ART UNIT	PAPER NUMBER
1652	

DATE MAILED: 09/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/646,950	RINE ET AL.	
	Examiner	Art Unit	
	Delia M. Ramirez	1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,5,9,11,15 and 17* is/are pending in the application.

4a) Of the above claim(s) *15 and 17* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,5,9 and 11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/21/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☒ Other: *alignments*.

DETAILED ACTION

Status of the Application

Claims 1, 5, 9, 11, 15 and 17 are pending.

Applicant's response to the Office communication mailed on 6/15/2006 as filed on 6/28/2006 is acknowledged.

Applicant submits that the restriction requirement mailed on 3/8/2006 does not limit Group I to any particular aspects of claims 1 or 5, nor does it state that Group I included claims 1 and 5 only to the extent they read on certain subject matter. Thus, Applicant has construed Group I to encompass the entirety of the subject matter of original claims 1 and 5. According to Applicant, amended claims 1 and 5 only narrow the scope of these claims.

As clearly indicated in the restriction requirement, Group I was directed to vectors and cells comprising polynucleotides encoding the polypeptides of SEQ ID NO: 2 or 4. The Examiner did not indicate that claims 1 and 5 would be examined only to the extent they encompass the subject matter of Group I because claims 1 and 5 were considered generic linking claims encompassing the subject matter of Group I. Thus, the entire scope of the generic linking claim would have been examined. While it is agreed that claims 1 and 5 as amended by Applicant are narrower in scope than original claims 1 and 5, it is noted that amended claims 1 and 5 no longer encompass the subject matter of Group I. Furthermore, no pending claim is directed to the subject matter of Group I. In view of Applicant's amendment, the remaining claims are now directed to different inventions as those previously indicated in the restriction requirement. Restriction to one of the following inventions is required under 35 USC 121:

Group A, claims 1, 5, 9 and 11, drawn to a recombinant expression vector comprising a polynucleotide which hybridizes to the polynucleotide of SEQ ID NO: 5 or 6, and a host cell transduced with said vector, class 435, subclass 320.1; and

Group B, claims 15 and 17, drawn to a method of identifying a compound which inhibits the proteolytic removal of an AAX tripeptide of a CAAX protein in a cell, wherein said method comprises contacting a sample with a host cell transduced with a vector that comprises a polynucleotide which hybridizes to the polynucleotide of SEQ ID NO: 5 or 6, class 435, subclass 23.

The inventions of Groups A and B are distinct for the following reasons. Inventions A and B are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP 806.05(h)). In the instant case the recombinant expression vectors of Group A can be used to produce the corresponding proteins as well as in the method of Invention B.

As set forth in MPEP § 803, the criteria for a proper restriction between patentably distinct inventions requires that the inventions must be independent or distinct as claimed, and a search of all the inventions would impose a serious burden on the examiner. Groups A-B have been shown to be independent or distinct, for the reasons set forth above. MPEP § 803 also indicates that a serious burden on the examiner may be prima facie shown if the Examiner shows by appropriate explanation either separate classification, separate status in the art, or a different field of search. As indicated above, the inventions of Groups A-B have acquired a separate status in the art because of their recognized divergent subject matter, as shown by their different classification. In addition, a search of all the inventions would require at a minimum a separate patented/non-patented literature search and a class/subclass search, therefore a comprehensive examination of all groups would impose an undue burden on the Examiner. Thus, restriction for examination purposes as indicated is proper.

The Examiner has required restriction between product and process claims. Where applicant elects claims directed to the product, and the product claims are subsequently found allowable, withdrawn process claims that depend from or otherwise require all the limitations of the allowable product claim

will be considered for rejoinder. All claims directed a nonelected process invention must require all the limitations of an allowable product claim for that process invention to be rejoined.

In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103 and 112. Until all claims to the elected product are found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowable product claim will not be rejoined. See MPEP § 821.04(b). Additionally, in order to retain the right to rejoinder in accordance with the above policy, applicant is advised that the process claims should be amended during prosecution to require the limitations of the product claims. Failure to do so may result in a loss of the right to rejoinder. Further, note that the prohibition against double patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.

Applicant's responses filed on 6/28/2006 and 4/1/2006 have been construed as an election of new Group A. Claims 15 and 17 are withdrawn from further consideration by the Examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention. Claims 1, 5, 9 and 11 are at issue and are being examined herein.

Specification

1. The specification is objected to for the following reasons. The current status of application 09/165460 as cited in the first paragraph of the specification needs to be updated.

2. The specification is objected to as it refers to SEQ ID NO: 1 and 2 as nucleic acids encoding Afc1p and Rce1p. See page 3, lines 8-10. SEQ ID NO: 2 according to the sequence listing is the

sequence of a protein. Applicant's cooperation is requested to review the specification and make the necessary changes such that there is consistency between the sequences referred to in the specification and those of the sequence listing. Appropriate correction is required.

Priority

3. Acknowledgment is made of a claim for domestic priority under 35 U.S.C. 119(e) to provisional application No. 60/023,491 filed on 08/07/1996.

4. Acknowledgment is made of a claim for domestic priority under 35 U.S.C. 120 or 121 to US application No. 09/165,460 filed on 10/02/1998, and 08/902,774 filed on 07/30/1997.

5. While SEQ ID NO: 5 and 6 have not been disclosed in the sequence listing of those applications to which priority is claimed, it is noted that US provisional application No. 60/023,491, US application No. 09/165,460 and 08/902,774 disclose SEQ ID NO: 5 and 6 as EST entries W14344 and Z43273. Upon conducting a sequence search in the EST database, SEQ ID NO: 5 and 6 have been found to correspond to EST entries W14344 and Z43273 as first disclosed on 4/26/1996 and 11/14/1994, respectively.

Information Disclosure Statement

6. The information disclosure statement (IDS) submitted on 8/21/2003 is acknowledged. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Objections

7. Claims 1 and 5 are objected to due to the recitation of "hybridizes with human EST ...." for the following reasons. As known in the art hybridization occurs between nucleic acid molecules. An EST is

a sequence, which is a graphical representation of the order in which nucleotides are arranged in a nucleic acid molecule. It is suggested that the term amended to clearly indicate that hybridization is between nucleic acid molecules. Appropriate correction is required.

Claim Rejections - 35 USC § 112, Second Paragraph

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 1, 5, 9 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

10. Claims 1 and 5 (claims 9 and 11 dependent thereon) are indefinite in the recitation of "polynucleotide which naturally encodes an Afc1/Rce1 polypeptide" for the following reasons. While the specification discloses yeast proteins labeled Afc1 and Rce1 as catalyzing the proteolytic removal of an AAX tripeptide from a prenylated CAAX protein, the specification fails to disclose which are the structural/functional characteristics which are unique to an Afc1 or an Rce1 polypeptide from any organism such that one of skill in the art could clearly distinguish an Afc1 polypeptide or an Rce1 polypeptide from other CAAX proteases. It is noted that Cadinanos et al. (GenBank accession number MMU251645, 2000) disclose a mouse polynucleotide comprising the EST of SEQ ID NO: 5 except for one indel, wherein said mouse polynucleotide encodes a CAXX protease labeled Face-2. See attached alignment and entry labeled "Title". Since there is no disclosure regarding the specific structural and functional characteristics which are associated with Afc1 or Rce1 polypeptides such that one could differentiate them from other enzymes which catalyze the proteolytic removal of an AAX tripeptide from a prenylated CAAX protein, one of skill in the art cannot reasonably apprised of the scope of the

invention. For examination purposes, no patentable weight will be given to the terms "Afc1 polypeptide" and "Rce1 polypeptide". Correction is required.

Claim Rejections - 35 USC § 112, First Paragraph

11. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

12. Claims 1, 5, 9 and 11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 1 and 5 are directed to a genus of vectors comprising nucleic acids encoding polypeptides that mediate the proteolytic removal of an AAX tripeptide from a prenylated CAAX protein, wherein said nucleic acids hybridize under any conditions to the polynucleotides of SEQ ID NO: 5 or 6. Claims 9 and 11 are directed to recombinant cells transduced with the genus of vectors of claims 1 and 5, respectively. See Claim Rejections under 35 USC 112, second paragraph for claim interpretation.

In *University of California v. Eli Lilly & Co.*, 43 USPQ2d 1938, the Court of Appeals for the Federal Circuit has held that "A written description of an invention involving a chemical genus, like a description of a chemical species, 'requires a precise definition, such as by structure, formula, [or] chemical name,' of the claimed subject matter sufficient to distinguish it from other materials". As indicated in MPEP § 2163, the written description requirement for a claimed genus may be satisfied through sufficient description of a representative number of species by actual reduction to practice, reduction to drawings, or by disclosure of relevant, identifying characteristics, i.e., structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed

correlation between function and structure, or by a combination of such identifying characteristics, sufficient to show that Applicant was in possession of the claimed genus. In addition, MPEP § 2163 states that a representative number of species means that the species which are adequately described are representative of the entire genus. Thus, when there is substantial variation within the genus, one must describe a sufficient variety of species to reflect the variation within the genus.

In the instant case, the claims encompass a large genus of polynucleotides which are essentially unrelated in structure. The specification discloses the structure of the polynucleotide of SEQ ID NO: 5 and 6 as ESTs, and discloses two yeast polynucleotides encoding CAAX proteases (SEQ ID NO: 1 and 3). However, the specification fails to provide any information as to (1) the structures of all the polynucleotides encompassed by the claims, (2) which segments of the polynucleotides of SEQ ID NO: 5 and 6 are required in a polynucleotide to encode a protein having the recited enzymatic activity, (3) whether any polynucleotide which hybridizes to the polynucleotides of SEQ ID NO: 5 or 6 under any conditions would encode a protein having the desired enzymatic activity, (4) a correlation between structure and the enzymatic activity recited, (5) the hybridization conditions which would provide only polynucleotides encoding proteins having the required activity, or (6) whether the polypeptides encoded by the polynucleotides of SEQ ID NO: 5 or 6 have enzymatic activity.

The genus of polynucleotides required is a large variable genus with the potentiality of comprising species having a highly diverse structure. A description of a genus of polynucleotides may be achieved by means of a recitation of a representative number of polynucleotides, defined by nucleotide sequence, falling within the scope of the genus or a recitation of structural features common to the members of the genus, which features constitute a substantial portion of the genus. In the instant case, the structural features recited, i.e., "hybridizes under <u>any</u> conditions to the polynucleotide of SEQ ID NO: 5/6", do not constitute a substantial portion of the genus as the remainder of any polynucleotide comprising said structural elements is completely undefined and the specification does not define the

remaining structural features for members of the genus to be selected. Furthermore, even if the claims were to be restricted to nucleic acids comprising the ESTs of SEQ ID NO: 5 and 6, the disclosed structural features, i.e., SEQ ID NO: 5 and 6, do not constitute a substantial portion of the genus since the genus encompasses genes whose structures have not been disclosed.

While one could argue that the disclosure of SEQ ID NO: 5 and 6 provides adequate description for all the structurally diverse members of the genus, it is noted that the art teaches several examples of how even small changes in structure can lead to changes in function. For example, Witkowski et al. (Biochemistry 38:11643-11650, 1999) teaches that mutations which result in one conservative amino acid substitution transform a β-ketoacyl synthase into a malonyl decarboxylase and completely eliminate β-ketoacyl synthase activity. Seffernick et al. (J. Bacteriol. 183(8):2405-2410, 2001) teaches that two naturally occurring Pseudomonas enzymes having 98% amino acid sequence identity catalyze two different reactions: deamination and dehalogenation, therefore having different function. Therefore, since (a) minor structural changes may result in changes affecting function, (b) there is no additional information correlating structure with the required function, (c) there is no teaching or suggestion as to which portions of the polynucleotides of SEQ ID NO: 5 or 6 are required in a polynucleotide encoding a polypeptide such that it would display the required activity, and (d) no information has been provided in regard to which nucleotides in the polynucleotides of SEQ ID NO: 5 or 6 can be modified and which ones need to be conserved to avoid loss of activity in the corresponding polypeptide, one cannot reasonably conclude that SEQ ID NO: 5 and 6 are representative of the structures of all the polynucleotides required by the claimed invention.

Due to the fact that the specification only discloses the polynucleotides of SEQ ID NO: 5 and 6, and the lack of description of any additional species by any relevant, identifying characteristics or properties, one of skill in the art would not recognize from the disclosure that Applicant was in possession of the claimed invention.

13. Claims 1, 5, 9 and 11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Factors to be considered in determining whether undue experimentation is required are summarized in *In re Wands* (858 F.2d 731, 737, 8 USPQ2nd 1400 (Fed. Cir. 1988)) as follows: (1) quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence and absence of working examples, (4) the nature of the invention, (5) the state of prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breath of the claims. The factors which have lead the Examiner to conclude that the specification fails to teach how to make and/or use the claimed invention without undue experimentation, are addressed in detail below.

The breath of the claims. Claims 1, 5, 9 and 11 are so broad as to encompass (1) vectors comprising nucleic acids encoding polypeptides that mediate the proteolytic removal of an AAX tripeptide from a prenylated CAAX protein, wherein said nucleic acids hybridize under any conditions to the polynucleotides of SEQ ID NO: 5 or 6, and (2) recombinant cells transduced with the vectors of (1). See Claim Rejections under 35 USC 112, second paragraph for claim interpretation. The enablement provided is not commensurate in scope with the claims due to the extremely large number of polynucleotides of virtually unknown structure encompassed by the claims and the fact that there is no indication that the polypeptides encoded by the polynucleotides of SEQ ID NO: 5 and 6 have the required enzymatic activity.

The amount of direction or guidance presented and the existence of working examples. The specification discloses the nucleotide sequences of the polynucleotide of SEQ ID NO: 5 and 6 as ESTs which can be used to isolate mammalian homologues of the yeast CAAX proteases disclosed. However,

the specification fails to provide any information regarding the structural elements required in any polynucleotide which hybridizes under any conditions to the polynucleotides of SEQ ID NO: 5 or 6 such that they would encode proteins having the desired enzymatic activity.

The state of prior art, the relative skill of those in the art, and the predictability or unpredictability of the art. The nucleotide sequence of the coding region of a polynucleotide encoding a protein determines the structural and functional properties of that protein. In the instant case, neither the specification nor the art provide a correlation between structure and activity such that one of skill in the art can envision the structure of any polynucleotide which hybridizes under any conditions to the ESTs of SEQ ID NO: 5 or 6 and encodes a polypeptide that mediates the proteolytic removal of an AAX tripeptide from a prenylated CAAX protein. In addition, the neither the specification nor the art provide any teaching as to (1) which are the structural elements required in the polynucleotides recited such that they would encode a protein having the desired function, (2) which are the structural elements within SEQ ID NO: 5 or 6 that are essential for the required activity, (3) which are the hybridization conditions which would allow isolation of those polynucleotides encoding the required polypeptides, or (4) which are the structural elements in addition to the polynucleotides of SEQ ID NO: 5 or 6 required for a polynucleotide to encode a protein able to mediate the proteolytic removal of an AAX tripeptide from a prenylated CAAX protein.

The art clearly teaches that changes in a protein's amino acid sequence to obtain the desired activity without any guidance/knowledge as to which amino acids in a protein are required for that activity is highly unpredictable. At the time of the invention there was a high level of unpredictability associated with altering a polypeptide sequence with an expectation that the polypeptide will maintain the desired activity. For example, Branden et al. (Introduction to Protein Structure, Garland Publishing Inc., New York, page 247, 1991) teach that (1) protein engineers are frequently surprised by the range of effects caused by single mutations that they hoped would change only one specific and simple property in

enzymes, (2) the often surprising results obtained by experiments where single mutations are made reveal how little is known about the rules of protein stability, and (3) the difficulties in designing *de novo* stable proteins with specific functions. The teachings of Branden et al. are further supported by the teachings of Witkowski et al. (Biochemistry 38:11643-11650, 1999) and Seffernick et al. (J. Bacteriol. 183(8):2405-2410, 2001) already discussed above, where it is shown that even small amino acid changes result in enzymatic activity changes.

The quantity of experimentation required to practice the claimed invention based on the teachings of the specification. While methods of generating or isolating variants of a polynucleotide were known in the art at the time of the invention, it was not routine in the art to screen by a trial and error process for the extremely large number of polynucleotides encompassed by the claims. In the absence of (1) knowledge/guidance as to the structural elements required in the recited polynucleotides to encode the required polypeptides, (2) knowledge/guidance as to the structural elements within SEQ ID NO: 5 or 6 associated with the ability to mediate the proteolytic removal of an AAX tripeptide from a prenylated CAAX protein, and/or (3) a correlation between structure and function, one of skill in the art would have to test an extremely large number of polynucleotides to determine which ones encode proteins with the desired activity.

Therefore, taking into consideration the extremely broad scope of the claims, the lack of guidance, the amount of information provided, the lack of knowledge about a correlation between structure and function, the high degree of unpredictability of the prior art in regard to structural changes and their effect on function, one of ordinary skill in the art would have to go through the burden of undue experimentation in order to practice the claimed invention. Thus, Applicant has not provided sufficient guidance to enable one of ordinary skill in the art to make and use the invention in a manner reasonably correlated with the scope of the claims.

Art of Interest

14. Kikly et al. (U.S. Patent No. 6060277) discloses polynucleotides encoding a human CAAX protease comprising the polynucleotide of SEQ ID NO: 6 except for four mismatches. See attached alignment. Kikly et al. also teaches vectors and host cells comprising said polynucleotides.

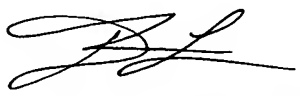
15. As indicated above, Cadinanos et al. (GenBank accession number MMU251645, 2000) disclose a mouse polynucleotide comprising the EST of SEQ ID NO: 5 except for one indel, wherein said mouse polynucleotide encodes a CAXX protease labeled Face-2.

Conclusion

16. No claim is in condition for allowance.

17. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PMR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Delia M. Ramirez whose telephone number is (571) 272-0938. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Ponnathapura Achutamurthy can be reached on (571) 272-0928. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1600.



Delia M. Ramirez, Ph.D.
Patent Examiner
Art Unit 1652

DR
September 15, 2006

c	8	38.4	10.7	1039	3	US-09-902-540-1280 Sequence 1280, Ap
c	9	38.4	10.7	4167	3	US-09-973-278-700 Sequence 700, App
c	10	38.4	10.7	130563	3	US-09-949-016-12273 Sequence 12273, A
c	11	38.4	10.7	131379	3	US-09-949-016-16050 Sequence 16050, A
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c	16	38.2	10.7	172	3	US-08-973-391C-7 Sequence 7, Appli
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c	22	38.2	10.7	172	3	US-10-625-221-6 Sequence 6, Appli
c	23	38.2	10.7	172	3	US-10-625-221-7 Sequence 7, Appli
c	24	38.2	10.7	172	3	US-10-625-221-8 Sequence 8, Appli
c	25	38.2	10.7	172	3	US-10-625-221-11 Sequence 11, Appl
c	26	38.2	10.7	172	3	US-09-308-830B-3 Sequence 3, Appli
c	27	38.2	10.7	172	3	US-09-308-830B-4 Sequence 4, Appli
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	34	38	10.6	832	3	US-09-621-976-2813 Sequence 2813, Ap
c	35	37.8	10.6	612	3	US-09-902-540-1357 Sequence 1357, Ap
c	36	37.8	10.6	156324	3	US-09-949-016-13749 Sequence 13749, A
c	37	37.6	10.5	700	3	US-09-735-271-1141 Sequence 1141, Ap
c	38	37.6	10.5	2394	3	US-09-800-729-33 Sequence 33, Appl
	39	37.2	10.4	5913	3	US-09-949-016-2035 Sequence 2035, Ap
	40	37.2	10.4	43657	3	US-09-949-016-13777 Sequence 13777, A
c	41	37	10.3	3082	4	US-09-778-963B-1 Sequence 1, Appli
c	42	36.8	10.3	601	3	US-09-949-016-154403 Sequence 154403,
	43	36.8	10.3	144362	3	US-09-949-016-16066 Sequence 16066, A
	44	36.6	10.2	212139	3	US-09-949-016-16065 Sequence 16065, A
	45	36.4	10.2	354	3	US-10-131-827-8722 Sequence 8722, Ap

ALIGNMENTS

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RESULT 1
US-09-022-699-3
; Sequence 3, Application US/09022699
; Patent No. 6060277
;  GENERAL INFORMATION:
;    APPLICANT:  KIKLY, KRISTINE
;    APPLICANT:  SOUTHAN, CHRISTOPHER
;    APPLICANT:  KNAB, ANNE
;    TITLE OF INVENTION:  Human AFC1
;    NUMBER OF SEQUENCES:  3
;    CORRESPONDENCE ADDRESS:
;      ADDRESSEE:  RATNER & PRESTIA
;      STREET:  P.O. BOX 980
;      CITY:  VALLEY FORGE
;      STATE:  PA
;      COUNTRY:  USA
;      ZIP:  19482
;    COMPUTER READABLE FORM:
;      MEDIUM TYPE:  Diskette
;      COMPUTER:  IBM Compatible
;      OPERATING SYSTEM:  DOS
;      SOFTWARE:  FastSEQ for Windows Version 2.0
;    CURRENT APPLICATION DATA:
;      APPLICATION NUMBER:  US/09/022,699
;      FILING DATE:  12-FEB-1998
;      CLASSIFICATION:
;    PRIOR APPLICATION DATA:
;      APPLICATION NUMBER:  97304440.7
;      FILING DATE:  12-JUN-97
;    ATTORNEY/AGENT INFORMATION:
;      NAME:  PRESTIA, PAUL F
;      REGISTRATION NUMBER:  23,031
;      REFERENCE/DOCKET NUMBER:  GH-70380
;    TELECOMMUNICATION INFORMATION:
;      TELEPHONE:  610-407-0700
;      TELEFAX:  610-407-0701
;      TELEX:  846169
;  INFORMATION FOR SEQ ID NO:  3:
;    SEQUENCE CHARACTERISTICS:
;      LENGTH:  2035 base pairs
;      TYPE:  nucleic acid
;      STRANDEDNESS:  single
;      TOPOLOGY:  linear
;    MOLECULE TYPE:  cDNA
US-09-022-699-3

  Query Match             96.9%;  Score 347;  DB 3;  Length 2035;
  Best Local Similarity   98.6%;  Pred. No. 3.3e-83;
  Matches  358;  Conservative    0;  Mismatches    4;  Indels    1;  Gaps    1;

Qy          1 CATTATTAGCCAGATGAATTCTTTCCTGTGTTTTTTTTTATTTGCTGTATTAATTGGTCG 60
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        340 CATTATTAGCCAGATGAATTCTTTCCTGTGTTTTTTTTTATTTGCTGTATTAATTGGTCG 399

Qy         61 AAAGGAGCTTTTTGCTGCATTTGGTTTTTATGNTAGCCAACCCACTNTTATTGGACTATT 120
              || |||||||||||||||||||||||||||||| |||||||||||| ||||||||||||
Db        400 AAAGGAGCTTTTTGCTGCATTTGGTTTTTATGATAGCCAACCCACTCTTATTGGACTATT 459

Qy        121 GNNCATCTTCCAGTTTATTTTTTCACCTTACAATGNGGTTCTTTCTTTTTGCCTAACAGT 180
              | ||||||||||||||||||||||||||||||| |||||||||||||||||||||||||
Db        460 GANCATCTTCCAGTTTATTTTTTCACCTTACAATGAGGTTCTTTCTTTTTGCCTAACAGT 519

Qy        181 CCNAAGCCGCAGATTTGAGTTTCAAGCTGATGCA-TTGCCAAGAAACTTGGGAAGGCTAA 239
              || |||||||||||||||||||||||||||||| ||||||||||||||||||||||||||
Db        520 CCNAAGCCGCAGATTTGAGTTTCAAGCTGATGCATTTGCCAAGAAACTTGGGAAGGCTAA 579

Qy        240 AGNCTTATATTCTGCTTTAATCAAACTTAACAAAGATAACTTGGGATTCCCTGTTTCTGA 299
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        580 AGACTTATATTCTGCTTTAATCAAACTTAACAAAGATAACTTGGGATTCCCTGTTTCTGA 639

Qy        300 CTGGTTGTTCTCAATGTGGCATTATTCTCATCCTCCACTGCTAGAGAGACTTCAAGCTTT 359
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Db        640 CTGGTTGTTCTCAATGTGGCATTATTCTCATCCTCCACTGCTAGAGAGACTTCAAGCTTT 699

Qy        360 GAA 362
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Db        700 GAA 702


RESULT 2
US-09-022-699-1
; Sequence 1, Application US/09022699
; Patent No. 6060277
;  GENERAL INFORMATION:
;    APPLICANT:  KIKLY, KRISTINE
;    APPLICANT:  SOUTHAN, CHRISTOPHER
;    APPLICANT:  KNAB, ANNE
;    TITLE OF INVENTION:  Human AFC1
;    NUMBER OF SEQUENCES:  3
;    CORRESPONDENCE ADDRESS:
;      ADDRESSEE:  RATNER & PRESTIA
;      STREET:  P.O. BOX 980
;      CITY:  VALLEY FORGE
;      STATE:  PA
;      COUNTRY:  USA
;      ZIP:  19482
;    COMPUTER READABLE FORM:
;      MEDIUM TYPE:  Diskette
;      COMPUTER:  IBM Compatible
;      OPERATING SYSTEM:  DOS
;      SOFTWARE:  FastSEQ for Windows Version 2.0
;    CURRENT APPLICATION DATA:
;      APPLICATION NUMBER:  US/09/022,699
;      FILING DATE:  12-FEB-1998
;      CLASSIFICATION:
;    PRIOR APPLICATION DATA:
;      APPLICATION NUMBER:  97304440.7
;      FILING DATE:  12-JUN-97
;    ATTORNEY/AGENT INFORMATION:
;      NAME:  PRESTIA, PAUL F
;      REGISTRATION NUMBER:  23,031
;      REFERENCE/DOCKET NUMBER:  GH-70380
;    TELECOMMUNICATION INFORMATION:
;      TELEPHONE:  610-407-0700
;      TELEFAX:  610-407-0701
;      TELEX:  846169
;  INFORMATION FOR SEQ ID NO:  1:
;    SEQUENCE CHARACTERISTICS:
;      LENGTH:  2968 base pairs
;      TYPE:  nucleic acid
;      STRANDEDNESS:  single
;      TOPOLOGY:  linear
;    MOLECULE TYPE:  cDNA
US-09-022-699-1

  Query Match             90.2%;  Score 323;  DB 3;  Length 2968;
  Best Local Similarity   98.1%;  Pred. No. 9.3e-77;
  Matches  356;  Conservative    0;  Mismatches    4;  Indels    3;  Gaps    3;
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Qy          1 CATTATTAGCCAGATGAATTCTTTCCTGTGTTTTTTTTTATTTGCTGTATTAATTGGTCG 60
              || |||||||||||| |||||||||||||| |||||||||||||||||||||||||||||||
Db       1079 CATTATTAGCCAGA-GAATTCTTTCCTGTG-TTTTTTTTATTTGCTGTATTAATTGGTCG 1136

Qy         61 AAAGGAGCTTTTTGCTGCATTTGGTTTTTATGNTAGCCAACCCACTNTTATTGGACTATT 120
              ||||||||||||||||||||||||||||||| |||||||||||| ||||||||||||||
Db       1137 AAAGGAGCTTTTTGCTGCATTTGGTTTTTATGATAGCCAACCCACTCTTATTGGACTATT 1196

Qy        121 GNTCATCTTCCAGTTTATTTTTTCACCTTACAATGNGGTTCTTTCTTTTTGCCTAACAGT 180
              | ||||||||||||||||||||||||||||||| |||||||||||||||||||||||||
Db       1197 GATCATCTTCCAGTTTATTTTTTCACCTTACAATGAGGTTCTTTCTTTTTGCCTAACAGT 1256

Qy        181 CCTAAGCCGCAGATTTGAGTTTCAAGCTGATGCA-TTGCCAAGAAACTTGGGAAGGCTAA 239
              |||||||||||||||||||||||||||||||| |||||||||||||||||||||||||
Db       1257 CCTAAGCCGCAGATTTGAGTTTCAAGCTGATGCATTTGCCAAGAAACTTGGGAAGGCTAA 1316

Qy        240 AGACTTATATTCTGCTTTAATCAAACTTAACAAAGATAACTTGGGATTCCCTGTTTCTGA 299
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1317 AGACTTATATTCTGCTTTAATCAAACTTAACAAAGATAACTTGGGATTCCCTGTTTCTGA 1376

Qy        300 CTGGTTGTTCTCAATGTGGCATTATTCTCATCCTCCACTGCTAGAGAGACTTCAAGCTTT 359
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1377 CTGGTTGTTCTCAATGTGGCATTATTCTCATCCTCCACTGCTAGAGAGACTTCAAGCTTT 1436

Qy        360 GAA 362
              |||
Db       1437 GAA 1439


RESULT 3
US-09-248-796A-5807
; Sequence 5807, Application US/09248796A
; Patent No. 6747137
; GENERAL INFORMATION:
;  APPLICANT: Keith Weinstock et al
;  TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO CANDIDA
ALBICANS
;  TITLE OF INVENTION:  FOR DIAGNOSTICS AND THERAPEUTICS
;  FILE REFERENCE: 107196.132
;  CURRENT APPLICATION NUMBER: US/09/248,796A
;  CURRENT FILING DATE:  1999-02-12
;  PRIOR APPLICATION NUMBER: US 60/074,725
;  PRIOR FILING DATE: 1998-02-13
;  PRIOR APPLICATION NUMBER: US 60/096,409
;  PRIOR FILING DATE: 1998-08-13
;  NUMBER OF SEQ ID NOS: 28208
; SEQ ID NO 5807
;   LENGTH: 1473
;   TYPE: DNA
;   ORGANISM: Candida albicans
US-09-248-796A-5807

  Query Match             15.3%;  Score 54.6;  DB 3;  Length 1473;
  Best Local Similarity   50.4%;  Pred. No. 4.1e-05;
  Matches  180;  Conservative    0;  Mismatches  173;  Indels    4;  Gaps    2;
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